Lock & Dam 16

(Illinois City, Illinois)
Mississippi River

U.S. ARMY CORPS OF ENGINEERS **BUILDING STRONG®**

Construction: 1933-1937
General Contractors:
Lock and Dam: Central Engineering Company, Davenport, Iowa

Congressional District: IA-2; IL-17

Description

Lock and Dam 16 is about one mile upstream from Muscatine, Iowa, and 457.2 miles above the confluence of the Mississippi and Ohio rivers. The complex stretches across the river at a point where the valley is wide. The earthen embankment section of the dam straddles portions of Hog Island in the main channel.

The lock dimensions are 110 feet wide by 600 feet long with additional provisions for an auxiliary lock. The maximum lift is nine feet with an average lift of 6.5 feet. It takes approximately seven minutes to fill or empty the lock chamber.

The movable dam has 12 non-submersible Tainter gates (20 feet high and 40 feet long), three submersible Tainter gates of the same dimensions, and four non-submersible roller gates (20 feet high and 80 feet long). The dam system also includes a linear, concrete capped, ogee spillway; and a submersible earth and sand-filled dike. It takes eight hours for water to travel from Lock and Dam 15, in Davenport, Iowa, to Lock and Dam 16.

History/Significance

Construction on Lock 16 began on Nov. 17, 1933, and was completed in February 1937. Construction on Dam 16 began in January 1935 and was completed in February 1937. The structure was placed in operation on July 10, 1937.

Dam 16 was the last dam in the Rock Island District to employ non-submersible roller gates, as well as Tainter gates (submersible and non-submersible), which had steel sheeting on only one side. It was also the first dam in the District in which all the Tainter gates were operated by line shafts and motors housed in installations above each gate, rather than from locomotive hoist cars running on the dam's service bridge.

Funds for the design and construction of Lock 16 were provided by the National Industrial Recovery Act and the Public Works Act Appropriation. Four sites were investigated for the location of Lock and Dam No. 16: roughly 2,500 feet below the Muscatine High Bridge, at Muscatine, near Fairport and the selected site at Hog Island.

Below-normal river stages and mild winters for the entire construction period were advantageous to the contractor. The river stages ranged from a low of 531.2 to a high of 541.9 feet (mean seal level). During late 1933 and early 1934 the water surface elevations were at times lower than any previously recorded since 1864. Decisions by the contractor on the procedure to completely dewater cofferdams caused a 30-day delay in construction. Because of

change orders and certain weather conditions, a total extension of 110 days was needed by the contractor for completion of the lock facility. The average daily number of employees on the lock facility was 335 with a peak of 735 employees on September 1, 1934.

The lock and dam elements of the complex were completed at a cost of $3,682,000.

Annual Tonnage (20-Year Historical)

Year	Tons	Year	Tons	Year	Tons	Year	Tons
1992	31,641,434	1997	27,196,206	2002	30,323,912	2007	21,598,027
1993	19,544,101	1998	28,872,800	2003	25,912,587	2008	16,494,518
1994	23,457,429	1999	33,139,184	2004	21,279,884	2009	19,417,486
1995	29,616,560	2000	30,583,395	2005	21,350,740	2010	18,453,809
1996	29,895,705	2001	26,451,754	2006	22,708,972	2011	18,085,452

Commodity Tonnage & Lockages (2011)

Coal	2,098,194
Petroleum	213,984
Chemicals	2,869,542
Crude Materials	2,260,695
Manufactured Goods	1,224,145
Farm Products	9,281,741
Manufactured Machinery	75,500
Waste Material	41,600
Containers & Pallets	1,600
Unknown	18,451

Subtotals:	Grain	8,540,520
	Steel	74,720
Lockages:	Commercial Boats:	1,844
	Recreation Boats:	536
	Light Boats:	729
	Other Boats:	96
	Total Boats:	3,205
	Total Cuts:	3,822

The 9-Foot Channel Project

Lock and Dam 16 is one of 29 locks and dams on the Upper Mississippi River that provide a water stairway of travel for commercial and recreational traffic from Minneapolis to the Gulf of Mexico.

The existing 9-foot Channel Navigation Project was largely constructed in the 1930s and extends down the Upper Mississippi River from Minneapolis-St. Paul to its confluence with the Ohio River and up the Illinois Waterway to the Thomas J. O'Brien Lock in Chicago. It includes 37 Locks and approximately 1,200 miles of navigable waterway in Illinois, Iowa, Minnesota, Missouri and Wisconsin.

The maintenance needs of the aging infrastructure are increasing at a rate much greater than the operations and maintenance funding provided for the system which adversely affects reliability of the system. Long-established programs for preventive maintenance of major lock components have essentially given way to a fix-as-fail strategy, with repairs sometimes requiring weeks or months to complete. Depending on the malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

Additionally, the system's 600-foot locks do not accommodate today's modern tows without splitting and passing through the lock in two operations. This procedure requires uncoupling barges at midpoint which triples lockage times and exposes deckhands to increased accident rates.

There are more than 580 manufacturing facilities, terminals, grain elevators, and docks that ship and receive tonnage in the Upper Mississippi River basin. Grains (corn and soybeans) dominate traffic on the system. Other commodities, mainly cement and concrete products, comprise the second largest group. A modern 15-barge tow transports the equivalent of 1,050 large semi-trucks (26,250 cargo tons, 875,000 bushels, or 17,325,000 gallons). Annually, the 9-foot project generates an estimated $1 billion of transportation cost savings compared with the operation and maintenance costs of approximately $115 million.